(No Model.)

E. B. & H. S. MUNSON.

MANUFACTURE OF BOXES FROM PAPER, CARD BOARD, &c.

No. 259,416. Patented June 13, 1882.

Fig. 1

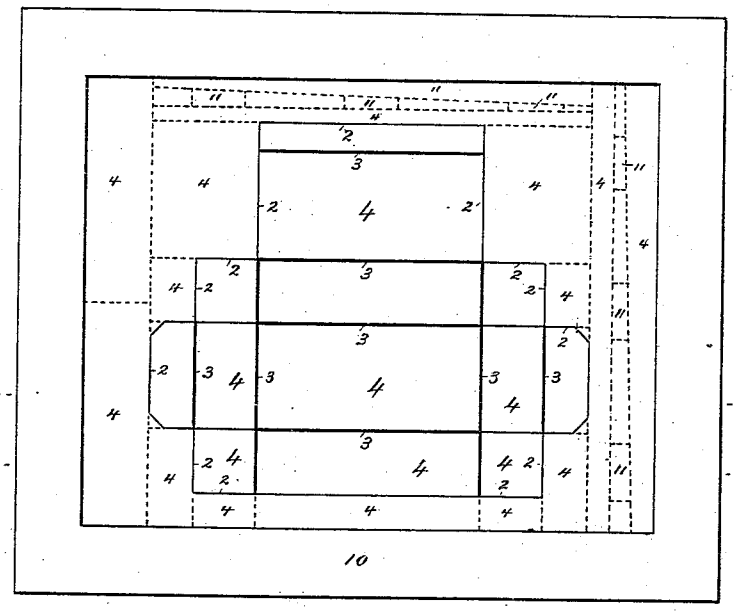


Fig. 2.

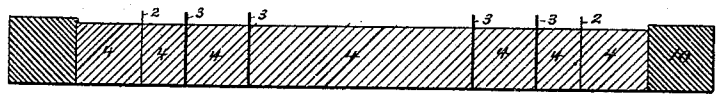


Fig. 3.

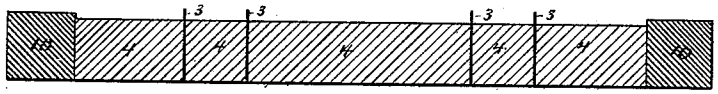


Fig. 4.

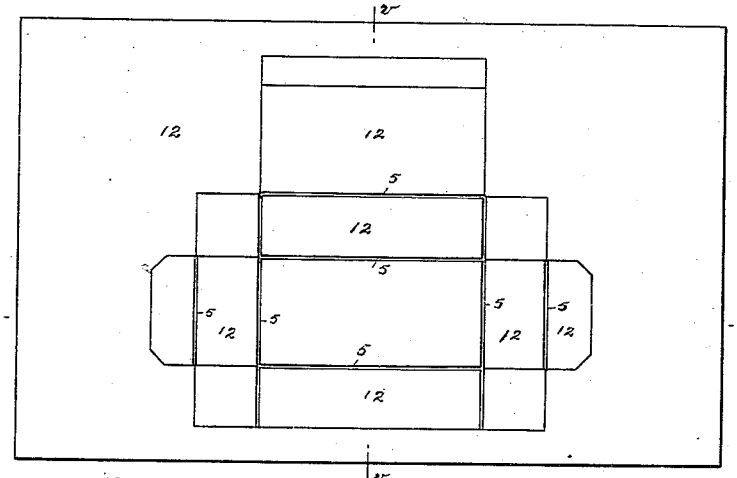


Fig. 5

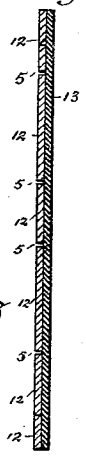
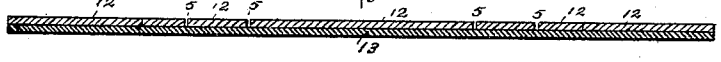


Fig 6.



Attest:

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N. PETERS. Photo-Lithographer. Washington, D. C.

UNITED STATES PATENT OFFICE.

EDWARD B. MUNSON AND HARVEY S. MUNSON, OF NEW HAVEN, CONN.

MANUFACTURE OF BOXES FROM PAPER, CARD-BOARD, &c.

SPECIFICATION forming part of Letters Patent No. 259,416, dated June 13, 1882.

Application filed March 22, 1880. (No model.)

To all whom it may concern:

Be it known that we, EDWARD B. MUNSON and HARVEY S. MUNSON, citizens of the United States, residing in the city and county of New Haven and State of Connecticut, have invented certain new and useful Improvements in the Manufacture of Paper Boxes, which are fully described in the following specification and illustrated in the accompanying drawings, forming a part of the same.

In said drawings, Figure 1 represents a plan view of the die, of which Fig. 2 is a longitudinal section taken on the line *x*, and Fig. 3 a longitudinal section taken on the line *y*. Fig. 4 represents a plan view of the counter-die, of which Fig. 5 is a transverse section taken on the line *v* of Fig. 4; and Fig. 6 is a longitudinal section taken on the line *z* of Fig. 4.

This invention relates to the manufacture of boxes from paper, card-board, pasteboard, and like materials, and especially to the cutting out of blanks therefor and defining the lines of their ultimate foldings.

It is the object of this invention to provide for the production of these boxes at such a low cost as will permit their general use by manufacturers and dealers as a substitute for the cheap wrapping-sheets of paper and similar envelopes for inclosing or packaging goods or merchandise. In order to bring these boxes within a range of price which will permit their use for these purposes, they must be produced rapidly and with a small outlay of labor, which conditions make it necessary that most of the operations involved in their manufacture shall be performed by machinery.

In order to accommodate the great variety of goods which it is desirable that these boxes shall be used to package, it is necessary that the boxes shall be produced in a great variety of sizes and shapes, and as only one size or shape of box can be produced by a single apparatus it becomes necessary, in order to produce boxes of different sizes and shapes, to have a corresponding number of apparatuses, and hence that the apparatus employed shall be of an inexpensive nature and construction.

Having therefore in view the rapid and cheap production of these boxes in an unlimited number of sizes and shapes, the present invention consists in an improvement in the art of manufacturing box-blanks and in certain devices or structure of apparatus for carrying out the same, all of which will be fully herein explained and pointed out.

In producing boxes and like packing devices from paper, card-board, and the like, the material or stock is required to be severed on some lines to provide the boundary edges and free lapping parts, and to have other lines, or those upon which the foldings are ultimately made, to be definitely determined, so that the parts of a flat blank requisite to form a hollow box may be accurately bent or folded to produce the same.

The apparatus employed should not only be capable of cheap and speedy construction, but produce the above-named effects by the least number of operations, and its members which define the folding-lines must so act upon the material or stock as not to sever, partially divide, or otherwise unduly weaken the same or break the finished surface of the article.

The improvements effected by this invention, and now to be described in detail, accomplish the simultaneous performance of the operations of making cuts severing the material into proper form, and of defining the folding-lines, which lines of ultimate foldings are made by upsetting or embossing the material in such a manner as to avoid weakening the stock, while rendering it capable of bending without unduly straining or breaking in its body or upon its finished surface either in defining the lines or in folding the parts, and, further, avoids any disfigurement of the face surface of the finished article.

The apparatus is constructed so as to be capable of ready and cheap production, and so that it may be speedily adapted by simple manipulation to the production of various sizes and shapes of the article, and be quickly introduced and adjusted in a press. The said apparatus consists of a single die composed of such lengths and shapes of cutting-rule 2 as are necessary to produce the form and direction of cuts desired, or to make the shape of blank required, with which are associated such lengths and shapes of embossing or blunt-edged rules 3 as are required to produce the necessary lines of ultimate foldings. These cutting-rules 2 may be made of a height slightly in excess of that of the embossing-rules, and this is preferable. These rules, of various shapes and lengths, are

all set up in a form corresponding to that of the blank to be produced, with proper separating and supporting blocks 4, and the whole are locked in a frame or chase, 10, by wedges, as 11, in a manner similar to that in which printers' forms are made up. Such form or die is then fixed in a suitable press—as a printing-machine—and the platen, co-operating with the bed or die-carrier to make the impression, is furnished with a counter-die, Fig. 4, composed of a packing-sheet, 12, of paper or similar firm material that is fixed upon the face of the platen in such relation to the embossing-rules of the die as will provide recesses 5 for the same to register with. This counter-die may be made up directly upon the platen, but is preferably constructed upon a metal plate or sheet, 13, that is capable of introduction and removal from the platen, while only such narrow pieces of the packing-sheet 12 as are necessary to form the sides or borders of the recesses 5 need be provided, in which case the cutting-rules will cut directly upon the platen or plate 13. It is preferable that the whole surface of the platen shall be covered by the packing-sheet 12, in which the recesses 5 are formed, either by cutting out a suitable channel or indenting it by repeated contact with the die, so that while said recesses perform their functions the cutting-rules will also pass through the packing 12 and have direct contact with the platen or plate 13 in accomplishing the cutting operation.

By means of a die and counter-die thus constructed a sheet of heavy paper, card-board, or like material may be fed into a printing-machine or similar press containing these dies or apparatus, and be simultaneously cut into the proper form and embossed or upset from its rear face upon the desired lines, so that it may be folded up and secured in box form. In this manipulation the stock along the lines of folding will be upset or embossed by being stretched and forced into the recesses by the pressure of the embossing-rules, thus defining lines upon which the blank may be readily bent to form a box without rupturing or disfiguring the outer or face surface of the material, which embossed lines are stretched and upset in the direction which the paper necessarily takes in being folded, and to exactly the extent required to fold the same at an angle, by reason of the fact that the body of the blank bears upon the face of the packing 12, which supports the material along the border edges of the recesses, while the portions of the blank or material that are embossed are forcibly stretched or pressed into the recesses 5 by the embossing-rules 3, while the cutting-rules cut the lines of severance by passing through the body of the blank.

The packing 12 may be readily made of the requisite thickness to suit the extent of embossing required by using any appropriate thickness of paper or board of which these box-blanks are usually made.

This construction of apparatus enables the operation of cutting the lines of severance and defining the lines of foldings to be performed at a single operation, their structure permits the cheap and ready make-up of dies suited to produce any length or shape of cut or fold—that is, make any form of box-blank—and the sharp and blunt rules of the die are capable of repeated use in making up new forms, to which counter-dies may be inexpensively suited by applying a new packing or packing-sheet, and the removable character of the dies from the press aids the economic preparation of the press or its change from work upon one size of product to that of another of different size, shape, or form.

What is claimed is—

1. The improvement in the art of manufacturing box-blanks, the same consisting in simultaneously cutting the lines dividing the material into proper form and embossing their lines of ultimate folding, by pressing the same between a die composed of sharp cutting and blunt embossing-rules and a coacting counter-die, all substantially as described.

2. A die for forming box-blanks, constructed of cutting-rules disposed at various angles conforming to the direction of cuts required, and of similarly-disposed blunt embossing-rules for producing the necessary folding-lines, which rules are secured in a chase or frame by holding-blocks, all substantially as described.

3. A counter-die for forming box-blanks, consisting of a metal or other hard base and creasing or embossing channels the edges of which are raised above the plane of the hard base, substantially as described.

4. In the manufacture of paper-box blanks, a counter-die adapted to be removed from and adjusted upon the platen of a press, constructed of a sheet of metal or similar material affording a suitably-hard cutting-base, to the face of which is secured a covering or packing of paper or equivalent material to receive the embossing-rules of the coacting die, substantially as described.

5. In the manufacture of box-blanks, the combination, with a die consisting essentially of cutting and creasing rules, of a counter-die having a hard cutting-base and embossing channels above said base, whereby the material is simultaneously cut upon some lines and upset or creased upon other lines, which latter are stretched or conformed so as to readily bend in the folding operation, all substantially as described.

In testimony whereof we have hereunto set our hands in the presence of two subscribing witnesses.

EDWARD B. MUNSON.
HARVEY S. MUNSON.

Witnesses:
ANDREW O'NEILL,
ARCHER F. WILLIAMS.